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A STUDY OF UNITED STATES OIL IMPORT POLICY IN RELATION TO NATIONAL ECONOMY AND SECURITY.

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A STUDY OF UNITED STATES OIL IMPORT POLICY IN RELATION TO NATIONAL ECONOMY AND SECURITY

By

John Charles Bangert

Bachelor of Science, United States Naval Academy

1941

Submitted to the Graduate School of the University
of Pittsburgh in partial fulfillment of the
requirements for the degree of
Master of Science

Pittsburgh, Pennsylvania

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FOREWORD

This thesis has been prepared as a review of the importation of oil by the United States with regard to effects on the security and economy of the country.

The author wishes to express his appreciation to Professor Holbrook G. Botset, Head of the Petroleum Engineering Department, University of Pittsburgh, for his helpful suggestions as to reference material and the preparation of this thesis.

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I. INTRODUCTION

A. The Oil Import Problem

The quantity of oil imported into the United States is presently a matter of considerable concern to the United States petroleum and coal industries. In general, domestic oil producers claim that imported oil, chiefly from Venezuela, is supplanting rather than supplementing domestic production, with the result that some oil producing states have been forced by state laws to reduce allowable outputs to avoid overproduction, incentive to find new oil has been lessened, and conservation programs are threatened with destruction. Likewise, the coal industry claims that imports of heavy fuel oils* are a cause of recent decreases of coal production in the United States; thus weakening an industry important to the economy of the nation. These factions, therefore, advocate federal statutes to limit the quantity of oil to be imported by the United States.

Oil importing companies, on the other hand, believe that restricting oil imports would result in detrimental effects on the United States and foreign oil producing countries' economies, weaken the position of the United States in a troubled world, and tend to raise the level of consumer fuel costs.

From a national security viewpoint, most agree that an adequate domestic crude oil producing capacity must be maintained and that domestic supply must be supplemented by foreign oil supplies in order to wage war on

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* A refined product of crude petroleum used chiefly as a source of industrial heat energy.

a global basis. Estimates by the Petroleum Administration for War indicated that, in the four years immediately preceding World War II, reserve crude oil producing capacity averaged about 1,000,000 barrels daily while actual production was averaging 3,600,000 barrels daily.[1]

Oil supplies outside the United States, developed by Americans, were highly important in both World Wars I and II. In World War I the availability of large quantities of Mexican crude oil made it possible for the United States to meet the demand for fuel oil for the allied navies and merchant ships. In World War II Venezuela was an important supplier of oil for industry and for the allied armed forces. In later stages of the conflict, oil from the Middle East was a large part of the fuel used for operations in the Pacific. It is estimated[2] that at the height of the war, more than a third of the combined oil requirements of the United States and its allies for military and shipping needs were being met with oil produced outside the United States. Without Caribbean and Middle East sources to draw on, the military requirements of the United States and its allies for oil could not have been met.

Although it is generally agreed that adequate domestic reserves plus foreign supplies must be available for national emergency, there is disagreement as to the approach to this objective. Some believe that, since domestic production is the most reliable source during an emergency, and United States proven reserves are not increasing in proportion to those of other nations, foreign oil should be utilized to the utmost during peacetime, saving domestic reserves for national emergency. Opponents of this approach point out that available supplies of oil in the United States are greater than ever before and are still increasing rapidly because of increasing

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[1] References listed in the Bibliography

exploration and market demand, and that excessive imports will lessen the market for domestic oil, resulting in less incentive for finding new oil and the eventual deterioration of the United States petroleum industry.

Thus, the question of oil imports is intimately associated with the economic welfare and security of the United States and its relations with other oil producing nations. The present trend to increased amounts of imported oil makes it appropriate at this time to review the imports situation and its implications both domestic and foreign.

B. Purpose

The purpose of this paper is to review the oil imports situation, past and present, in regard to the economic welfare and security of the United States, and from this review to derive certain conclusions and recommendations which appear to form the basis for a sound oil import policy for the nation.

C. Assumptions

In this discussion of oil imports, the following assumptions are made:

1. That oil is indispensable to the economy and security of the nation.
2. That other sources of petroleum available in the United States such as oil shales, tar sands, natural gas, coal, and agricultural products, while important as possible future sources of oil, are not presently economically feasible as substitutes for naturally occurring crude oil produced under present technology.

These assumptions are considered realistic and are made for the purpose of simplifying this paper.

Certainly no one can deny that petroleum has become an indispensable commodity to the progress and welfare of the United States. No one influence can be cited as the most important cause of the rapid advancement of the United States but the wider use of mineral energy certainly has been a primary contributor. The importance of petroleum is portrayed by its increasing contribution to the shifting of man's burden to modern machines that are powered by petroleum products.

The degree of the importance of petroleum to our standard of living, to our position as a world leader, to our peacetime pursuits and to our military potential, is perhaps greater than to any other nation.

Petroleum is essential to the nation's peacetime welfare and indispensable and vital to the nation's security. The experience of two world

wars shows that victory would have been impossible without adequate petroleum supplies. In recognizing its growing importance the Secretary of the Interior, in October, 1951, said: "But, if another full-scale war should come, make no mistake about it, petroleum will be more vital to victory than ever before in our history."[3]

In addition to the reserves of natural petroleum in the United States, there are enormous deposits of oil shales, tar sands, coal deposits, solid bitumen and vein deposits from which liquid petroleum products may be obtained. However, these sources of supply are dependent largely on economics and in part on improved technology. While the magnitude of these potential resources constitutes a source of future supply, it is not considered that it affects the present day oil import situation.

II. REVIEW OF UNITED STATES OIL IMPORTS

A. History

Oil has been imported into, and exported from the United States almost since the beginning of the petroleum industry in 1859. During most of this time, exports have exceeded imports, although the nation was a net importer from 1920 through 1922. In 1923 it returned again to being a net exporter. Then in 1948, imports once more were greater, a situation which has continued to date. Table I of Appendix I lists total United States exports, imports, and net imports in barrels per day for the years 1936 through 1952, and including a 1953 estimate. These figures include both crude oil and refined products, the refined products imported consisting principally of heavy fuel oil. However, these figures do not include oil purchased and used abroad.

This country imports oil principally from the Western Hemisphere as indicated by Table II of Appendix I, which lists United States imports by hemisphere for the years 1946 through 1952. In 1952, over 82 per cent of oil imports were from the Western Hemisphere while in previous post-World War II years the percentages were even higher. Most of the oil imported from this hemisphere is produced in Venezuela, a country second only to the United States in oil production. In 1948, Venezuela, with an average production of 1,340,000 barrels per day, exported 1,181,000 barrels per day of which 403,000 barrels[4] were exported to the United States representing 90 per cent of United States Western Hemisphere imports for that year. In June, 1952, Venezuela's production had risen to 1,824,699 barrels per day of which 1,410,700 barrels[5] were exported. Since Venezuela is the principal

country from which the United States imports oil, it is apparent that limitations or reductions in imports by this country would effect the oil industry and economy of Venezuela.

B. Import-Export Trends

As indicated by Table I of Appendix I, the United States has been a net importer of oil since 1948. The trend has been toward increased imports with a record amount of oil entering the country in 1952 and an even greater net import predicted for 1953.

In 1947, oil imports approximately equaled exports. Since that time there has been a gradual lowering of export rates due to the development of other countries' production and refinery facilities in areas that once depended upon the United States as a source of refined products. Since that time United States oil gross imports have increased to the point that today they are more than twice the 1947 level and over three and one-half times the 1941 level.

The United States export market is gradually being whittled and the completion of a new pipeline into eastern Canada late in 1953 will further reduce United States exports since Canada is one of our principal export markets. This new pipeline will distribute Canada's western oil to her eastern markets and thus make the country more independent. Likewise, the expansion of European and Asian refinery installations has already made those areas less dependent upon supplies. Hence, it appears that the gap between oil brought into the country and that shipped out will continue to widen for the foreseeable future unless restrictions are placed on imports.

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III. PETROLEUM RESOURCES

A. World Trends

Worldwide proved reserves at the beginning of 1953 were put at 115,177,701,000 barrels by World Oil,[6] representing a gain of 13,540,720,000 barrels or 13.3 per cent over a year previous. The increase in the 1952 figure over the 1951 figure was 7.8 per cent; hence, the present trend is to increasing worldwide reserves at an increased pace.

The trend in proved reserves for principal oil producing areas from 1946 to 1953 is illustrated below:

Crude Oil Reserves

1946-1953[7]
(Millions of Barrels)

Area	1946	1953	Per cent Increase
Middle East	27	61.6	128.2
United States	20.8	29.0	27.9
Venezuela	7.0	9.6	37.2
Europe	8.8	7.6	(-) 13.6
Far East	1.3	2.3	77.0

From the above chart it can be seen that the United States crude oil reserve increase of 27.9 per cent is considerably less than that of any other principal oil producing area except Europe, whose reserves show a decrease of 13.6 per cent and are principally in the U.S.S.R. The tremendous increase in Middle East reserves of 128.2 per cent above 1946 reserves now

credits this region with 53.5 per cent of the world's crude oil reserves. During the same period the increase in United States reserves lagged Venezuela's which increased by 37.2 per cent. Thus, from a worldwide viewpoint, United States reserves are not increasing as rapidly as other major areas. Although the reason for this relative decline in the finding of new oil is probably the fact that the United States has been exploring for and producing oil on a commercial basis much longer than other areas, this situation exists and will probably continue.

Table III of Appendix I lists the estimated reserves of the principal producing areas of the world together with annual production and the ratio of reserves to annual production. It is noted that the ratio of reserves to annual production in the United States of 12.8 is lower than that of any other major producing area, the highest being the Middle East which has a current ratio of 80.8. From these figures it would appear that the United States is using up its reserves at a rapid pace since this ratio represents but 12.8 years of supply at present production rates; however, this is not the case. Table IV of Appendix I lists United States crude oil production versus proved crude oil reserves from 1937 to 1951, as well as the ratio of reserves to annual production for the same period. It can be seen that the ratio has remained fairly constant ranging from a low of 10.2 in 1937 to a high of 13.7 in 1940. Thus, the present ratio of 12.8, while low relative to other major oil producing regions, is no cause for alarm. The Committee on Oil and Gas Availability of the National Petroleum Council in its report of January 29, 1952 stated that[8] "Available supplies of oil and gas in the United States and the world are greater than ever before and are still increasing rapidly. Granted continuation of reasonable economic incentives and adequate supplies of materials, crude oil and natural gas may be counted upon to be available in abundance for the foreseeable future." This statement is borne out by the figures of Table IV,

Appendix I, which show that in 1937 the United States ratio of reserves to annual production was 10.2 with annual production of 1,279,160,000 barrels, while in 1951 annual production had increased to 2,250,000,000 barrels and the ratio of reserves to production had increased to 11.3. Hence, new reserves have kept pace with increased production and indications are that they will continue to do so, in the foreseeable future.

Since the United States, Middle East, and Venezuela account for approximately 87 per cent of the world's reserves and 83 per cent of world production, these regions only, plus Canada, which has given strong indications of a rapid increase in reserves and production, are considered as significant in this discussion.

B. Major Petroleum Regions

1. United States

As indicated by Table III of Appendix I, the United States had a crude reserve of 29,020,601,000 barrels at the close of 1952, representing a net gain of 1,552,570,000 barrels and 25.2 per cent of the world's total estimated reserves. In 1952, the United States produced 50.86 per cent of the total world production, or 2,262,269,000 barrels, which when added to the net gain in reserves for the year, means that during the year of 1952 the United States accounted for 3,814,839,000 barrels of newly discovered oil.

Beyond the known oil fields, the prospective area in the United States favorable to the existence of undiscovered deposits of oil and gas is vast. This prospective area is about 100 times[9] as large as the area of all the oil and gas fields found since oil was discovered more than 90 years ago.

Concerning future projections of oil production and capacity in the United States, the Western Hemisphere Oil Study Committee of the Independent Petroleum Association of America in its report of October, 1952, stated that,[10]

> "For the past ten years the petroleum production trend in the United States has been consistent. Production of crude oil and natural gas liquids during this period increased from 4,034,000 barrels daily to 6,713,000 in 1951. This represents an annual average increase of almost 300,000 barrels daily.
>
> "A projection of the trend of the past 10 years indicates a production rate of about 7,850,000 barrels daily in 1955 and 9,300,000 in 1960.

> "A projection of production, however, does not reflect any surplus or shut-in capacity that may have been available. A projection of capacity, therefore, might provide a better indicator of future availability. In 1946, at the close of World War II, the industry was producing 5,073,000 barrels daily which was at or near its capacity. The excess capacity at the beginning of the war had disappeared because of wartime restrictions. Since that time an excess capacity over and above the production rate had been built up. The National Petroleum Council estimated that as of January, 1951, the total productive capacity had been expanded to 7,300,000 barrels daily. This represents an annual average increase of about 500,000 barrels daily. A projection of this five-year trend of productive capacity indicates that in 1955 availability will be approximately 9,600,000 barrels daily and in 1960 about 12,000,000."

Hence, the above projections indicate that in 1955 the United States will have a surplus productive capacity of 1,750,000 barrels daily and 2,700,000 barrels daily in 1960. These figures are significant in that they represent a reserve productive capacity that would be utilized in the event of a major war. Without a reserve productive capacity, the nation might be faced with a petroleum shortage crisis, should imports be cut off by submarine blockade or other methods.

Charts 1 and 2 of Appendix II, taken from the Report of the Western Hemisphere Oil Study Committee of the Independent Petroleum Association of America, illustrate these projections of production and capacity respectively. It is noted that Chart 2 also presents the 1948 estimate of the American Petroleum Institute and that this estimate has already fallen short of actual productive capacity. Dependent of course on the continuation of economic and physical factors which affect the availability of oil, such as an equitable price for oil and adequate drilling rates, the straight line projections shown on Charts 1 and 2, based on 1946-1951 statistics, appear to be realistic.

The Petroleum Administration for Defense and the Department of Defense have estimated that the additional domestic oil production which would be needed in the event of a full scale war would be at least 1,000,000 barrels per day.[11]

2. Venezuela

The estimated crude oil reserves of Venezuela at the beginning of 1953 were 9,600,000,000 barrels, which represents 8.33 per cent of the world's proven reserves despite a decrease of 400 million barrels of proved reserves from the previous year. Known reserves of petroleum in Venezuela as of the beginning of 1952 were estimated at 10 billion barrels as compared with seven billion barrels in 1946, an increase of 45 per cent during that period; about three billion barrels of oil were produced during this period, making total additions to reserves about six billion barrels, or approximately two barrels for each barrel produced. Exploratory activity continues and several important discoveries have been made in recent years.

In World War II Venezuela was an important supplier of oil for industry and for the allied armed forces. Early in the war many tankers exporting oil were sunk by German submarines. Submarines surfaced in the harbor area in Aruba and Curacao and fired on the refineries. Eventually, however, a series of bases was established around the Caribbean from which anti-submarine forces could operate most effectively, freeing this area of the submarine menace.

In the event of a future war, there would probably be losses; however, in line with hemisphere defense, concerted efforts to keep the sea lanes open would be made in all probability. Hence, Venezuela should be considered as a source of oil to meet additional wartime requirements.

3. Middle East

As shown in Table III of Appendix I, the Middle East has estimated petroleum reserves amounting to 61,570 million barrels which represents a gain of 9,745 million barrels over the January 1, 1952 figure - an increase of 18.8 per cent. Possessing over 53 per cent of the world's reserves, this prolific region produced over 17 per cent of all the oil produced in the world during 1952 at the phenomenal ratio of reserve to production of 80.8. Middle East figures are estimates of actually proved reserves, and do not make allowance for any indicated reserves which would be a great deal larger. Middle East production has risen from 286,000 barrels per day in 1945 to 2,083,000 barrels per day[12] in 1952 and the trend is still upward. This area exports principally to Europe and Asia.

In the event of another war it seems unlikely that oil would be imported by the United States from this area since losses to submarines would be great due to the length of supply routes. However, on a global war basis, this area could prove invaluable in the support of European and Asian bases.

4. Canada

Western Canada is one of the most active oil exploration areas in the world today. Proved reserves are estimated to be 1,750,000,000 barrels as of January 1, 1953 and production in 1952 amounted to 61,578,000 barrels. (See Table III of Appendix I). Production in Canada has increased more rapidly than in any other area in the Western Hemisphere. The following table reflects this rapid growth from the years 1947 through 1951:

Canadian Crude Oil Production
1947-1951[13]

Year	Barrels per day
1947	21,000
1948	33,000
1949	58,000
1950	78,000
1951	129,000

Canada now ranks fourth as a Western Hemisphere oil producer following the United States, Venezuela, and Mexico. With almost a million square miles of potential producing land, Canada should eventually develop into one of the world's major producing regions and thus become an important supplier of oil for any future war.

IV. EFFECTS OF OIL IMPORTS

A. On National Security

National security requires a strong domestic petroleum industry with an adequate reserve productive capacity, plus access to foreign oil supplies. Speaking before the U.S. Senate Special Committee to Investigate Petroleum Resources on November 28, 1945, Ralph K. Davies, Deputy Petroleum Administrator for War, stated that,[14] "A global war demands global production, global refining, and global distribution," and, "Our military, maritime, and domestic consumption, not including lend-lease or other supplies to our allies and others, was greater than our domestic production. Without foreign oil and reverse lend-lease we should have fallen short, before V-J Day, of meeting our own home and overseas requirements." Based upon this experience gained during World War II, it therefore appears logical that imported oil should play an important part in a future war when both domestic and military requirements for oil would exceed those of World War II. If our defense were limited to oil from within our own borders, our ability to conduct a war on a global basis would at best be severely handicapped.

Maintenance of foreign sources of supply to meet the requirements of a national emergency depends to a considerable degree on keeping markets open to them. Hence, a cutting off or drastic reduction of imports, with the result that these countries would have to seek markets in other parts of the world and possibly incur the loss of their good will and trust, might jeopardize the ability of the United States to obtain oil from these sources during an emergency.

B. On the National Economy

The petroleum industry is one of the third or fourth largest industries in the United States; hence, should imported oil flood the country to the extent that domestic production is seriously curtailed, the vitality of the domestic petroleum industry would be destroyed, associated industries would suffer, and the general economy of the country would be shaken. Many states are primarily dependent on oil for a healthy economy. In this country's 27 oil-producing states, almost $6,000,000,000 worth of oil was produced in 1952.[15] In 17 of these oil-producing states, petroleum is one of the top three minerals. It is, therefore, obvious that economic health of these states is dependent upon the health of the domestic oil industry.

In addition, any damage to the domestic petroleum industry would be directly reflected in the economy of industries which supply and service the petroleum industry. A brief listing of these associated industries would include railroads and other carriers which transport oil, banks, which supply working capital to the industry, machine shops, pump manufacturers, tool companies and the steel industry. These and other industries and occupations would be directly affected by a serious curtailment of domestic oil operations.

Direct effects of excessive unregulated oil imports on the domestic oil industry would include:

1. Curtailment of stripper well and secondary recovery production, since these methods of production are relatively expensive, and the oil produced therefrom would not be competitive with cheaper foreign oil.

2. Reduction of exploration and drilling for new oil because of higher costs and a probably uncompetitive market price for produced oil, with the result that the industry would be unable to supply the volume of oil necessary for support of our expanding economy and defense program.
3. Reduction of the country's proved reserves by concentrating production in naturally flowing oil fields without the addition of new discoveries.
4. Damage to state conservation programs, since proper levels for domestic production cannot be determined unless import levels are known in advance.

The coal industry feels that increased imports of heavy fuel oils contributed to the decrease in coal production of 70 million tons in 1952 in relation to 1951. However, 10 million tons of the decrease was due to decreased exports and another 10 million tons to inventory changes resulting in a net decrease of 50 million tons which might be the result of heavy fuel oil imports. In this same period heavy fuel oil imports increased by the equivalent of but three million tons[16] of coal, an increase which was entirely offset by a decline of domestic heavy fuel oil production. Hence, the claim that heavy fuel oil imports resulted in a decline in coal production in 1952 appears to be without foundation.

On the other hand, curtailment or drastic reductions of oil imports could adversely affect the economy of the country in the following ways:

1. Hamper fuel supplies to the armed forces.
2. Injure United States business, labor and agriculture by diminishing the ability of other countries to buy American goods.

3. Tend to raise the general level of fuel costs to consumers and, therefore, the cost of many goods to the consuming public.

4. Destroy the vigorous, competitive attitude of the domestic oil industry by protecting it from competition.

The President's Material Policy Commission in its reports on natural resources issued in June, 1952, said:[17]

> "The energy economy of the United States has prospered on the basis of using the cheapest available fuels and can prosper most in the future if our import policy continues to permit consumers to have access to the lowest cost sources consistent with security. Geological and economic conditions throughout the world favor an increasing reliance on imports to meet a considerable part of the future growth of United States consumption, even though United States production of oil can also be expected to continue to grow. Consumption is expected to increase more rapidly than production, so as to leave room both for increasing imports and a healthy domestic oil industry."

C. On Other Countries

Countries exporting to the United States would be directly affected by legislation or other methods of reducing oil imports into the United States. Some of the effects of such restrictions are that they would be:

1. Contrary to this country's efforts to reduce foreign aid.
2. Contrary to this country's efforts to build up the "free world" economic strength through the reduction of trade barriers.
3. Disturbing to friendly nations and thereby impair United States prestige and leadership.
4. Damaging to the economy of oil producing countries.

Since Venezuela is the largest source of United States imports, and the second largest oil producing country in the world, the economy of that country would be seriously impaired by drastic United States import reductions.

A limitation on fuel oil imports to five per cent of the preceding quarterly domestic demand has been proposed in more than a score of bills introduced to Congress. This limitation would force shipments back from about 351,000 barrels daily to about 77,000 barrels daily, the reduction amounting to about 274,000 barrels. The Aruba and Curacao refineries operate almost entirely on Venezuelan oil and, in terms of crude runs, the 274,000 barrels daily of heavy fuel oil requires the processing of nearly 460,000 barrels of crude.[18]

A production cut of the magnitude anticipated would seriously depress the oil industry of Venezuela, and the economic effects would in turn

promote political upheaval. The threat of import restrictions has aroused hostility to the United States and there is talk of reorienting Venezuela's economy toward Europe.

V. SUMMARY AND CONCLUSIONS

What the oil import policy of the United States should be presents a very complex problem. Oil imports have economic and security implications both national and international. On the one hand, too large an import volume may damage the domestic petroleum industry to the extent that the national security of the nation would be in jeopardy. On the other hand, too small a volume could damage the economies of other nations, impair international trade and relations, and raise consumer costs in the United States.

The point at which imported oil commences to supplant rather than supplement domestic production is a useful index; however, it cannot be readily established. To some, this point is reached when the price of domestic crude drops. To others, this point has been reached when the rate of drilling decreases or domestic oil production is shut-in for want of a market.

Arguments based on premises of national security and economic welfare supporting a high volume of oil imports are basically the same as those used to further the position that domestic production should supply United States markets to the greatest extent possible. For example, importing companies can argue that the government urged them to develop worldwide petroleum resources in the interest of national security and that they must realize a reasonable profit from these investments in order to develop reserves. Likewise, domestic producers argue that they must realize a reasonable profit from production in order to provide funds for further expansion and the generation of greater domestic reserves in the interest of national security.

Based upon the review of oil imports presented in this paper, the following is concluded:

1. The United States has been a net importer of oil

since 1948, the trend has been to increased amounts of imports, and the gap between exports and imports will continue to widen in the future.

2. United States and worldwide oil production has been steadily increasing and will probably continue to do so.
3. A vigorous, expanding domestic oil industry with an adequate reserve producing capacity is essential to the national security and economy.
4. Without oil imports, domestic oil fields would have to be produced at or near maximum efficient rates to meet domestic demand, thereby diminishing the reserve producing capacity of the country to meet emergency needs. However, a reserve producing capacity must be figured over and above the import rate, as imports may be, at least temporarily, cut off in an emergency.
5. Imported oil has played an important part in the last two world wars and would also be vital to victory in a future global war.
6. The fact that domestic oil production has been steadily growing over a long period, at the same time that imports have also been rising, indicates that imports actually have been supplementing rather than supplanting domestic production.
7. Oil imports have not seriously affected the domestic petroleum industry in its continuing search for new oil and increased productive capacity in the interest of national security.

8. The oil import policy of the United States should take into consideration not only the interests of the domestic petroleum industry, but the effects of import limitations on the economy of other countries, on international trade in general, and on the domestic oil consumer as well.

VI. RECOMMENDATIONS

In considering what the oil import policy of the United States should be, one must take into account the national security, economic factors, both domestic and foreign, and the interests of the domestic consumer. These have all been considered in making the following recommendations:

1. That oil imports not be limited by legislative action until such time that it can be definitely established that imports are impairing the domestic petroleum industry to the point that an adequate reserve producing capacity and the growth of the industry are being jeopardized.
2. Should import restrictions become necessary under the circumstances mentioned in (1) above, the maximum import rates possible should be permitted.
3. That tariff rates be adjusted as a means of protecting the domestic oil industry before attempts are made to limit oil imports by legislative action.

APPENDIX I

APPENDIX I

Table I

Total United States Oil Exports-Imports

1936-1952[1]

(Daily Average - All Figures in Barrels)

Year	Exports	Imports	Net Imports
1936	360,600	156,000	(-) 204,600
1937	473,500	156,600	(-) 316,900
1938	530,800	148,800	(-) 382,000
1939	517,700	161,800	(-) 355,900
1940	356,500	228,800	(-) 127,700
1941	298,200	266,200	(-) 32,000
1942	320,300	98,500	(-) 221,800
1943	410,800	173,700	(-) 237,100
1944	567,200	252,200	(-) 315,000
1945	501,300	311,200	(-) 190,100
1946	419,500	377,200	(-) 42,300
1947	450,600	436,700	(-) 13,900
1948	367,400	514,000	(+) 146,600
1949	327,100	645,400	(+) 318,300
1950	304,900	850,000	(+) 545,100
1951	423,100	843,100	(+) 420,000
1952	420,700	953,400	(+) 532,700
1953 Estimate	353,400	1,038,400	(+) 685,000

Source: U. S. Bureau of Mines, except 1952 includes estimate for November and December

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[1] *World Oil*, p. 67, (February 15, 1953).

APPENDIX I

Table II

United States Total Oil Imports by Hemisphere

1946-1952[1]

(Daily Average - Figures in Thousands of Barrels/Day)

Year	Eastern Hemisphere	Western Hemisphere	Total	% Western Hemisphere of Total
1946	0	377	377	100.0
1947	8	428	436	98.2
1948	67	447	514	87.1
1949	102	543	645	84.2
1950	116	734	850	86.4
1951	107	737	844	87.3
1952	171	787	958	82.2

Source: U. S. Department of Commerce

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[1] *The Independent Petroleum Association of America Monthly*, p. 44, (May, 1953).

APPENDIX I

Table III

Estimated World Crude Oil Reserves and Annual Production[1]

(Thousands of Barrels)

	Estimated Reserves		Annual Production		
Continent or Country	Thousand Barrels Jan. 1, 1953	Per Cent of World	Thousand Barrels 1952	Per Cent of World	Ratio of Reserves to Annual Production
North America	32,473,101	28.19	2,402,761	54.01	13.5
Canada	1,750,000	1.52	61,578	1.38	28.4
United States	29,020,601	25.20	2,262,269	50.86	12.8
South America	10,995,000	9.55	762,310	17.14	14.4
Venezuela	9,600,000	8.33	656,045	14.75	14.6
Europe	7,635,000	6.63	386,810	8.70	19.7
U.S.S.R.	6,500,000	5.64	311,400	7.01	20.9
Africa	214,000	0.18	17,531	0.39	12.2
Middle East	61,570,000	53.46	762,207	17.14	80.8
Far East	2,290,500	1.99	116,377	2.62	19.7
World Total	115,177,701				

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[1] World Oil, p. 265, (February 15, 1953).

APPENDIX I

Table IV

United States Crude Oil Production and Proved Reserves[1]

Year	Crude Oil* Production (Thousand Barrels)	Proved Crude Oil** Reserves (Million Barrels)	Ratio of Reserves to Annual Production
1937	1,279,160	13,063.4	10.2
1938	1,214,355	15,507.3	12.8
1939	1,264,962	17,348.1	13.7
1940	1,353,214	18,483.0	13.7
1941	1,402,228	19,024.5	13.6
1942	1,386,645	19,589.3	14.1
1943	1,505,613	20,082.8	13.3
1944	1,677,904	20,064.2	12.0
1945	1,713,655	20,453.2	11.9
1946	1,733,939	19,941.8	11.5
1947	1,856,987	20,873.6	11.2
1948	2,020,185	21,487.7	10.6
1949	1,841,940	23,280.4	12.6
1950	1,971,845	24,649.5	12.5
1951	2,250,000	25,268.4	11.3

* Bureau of Mines
** American Petroleum Institute

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[1] "Petroleum Productive Capacity", National Petroleum Council, p. 42, (January 29, 1952).

APPENDIX II

APPENDIX II

CHART 1[1]

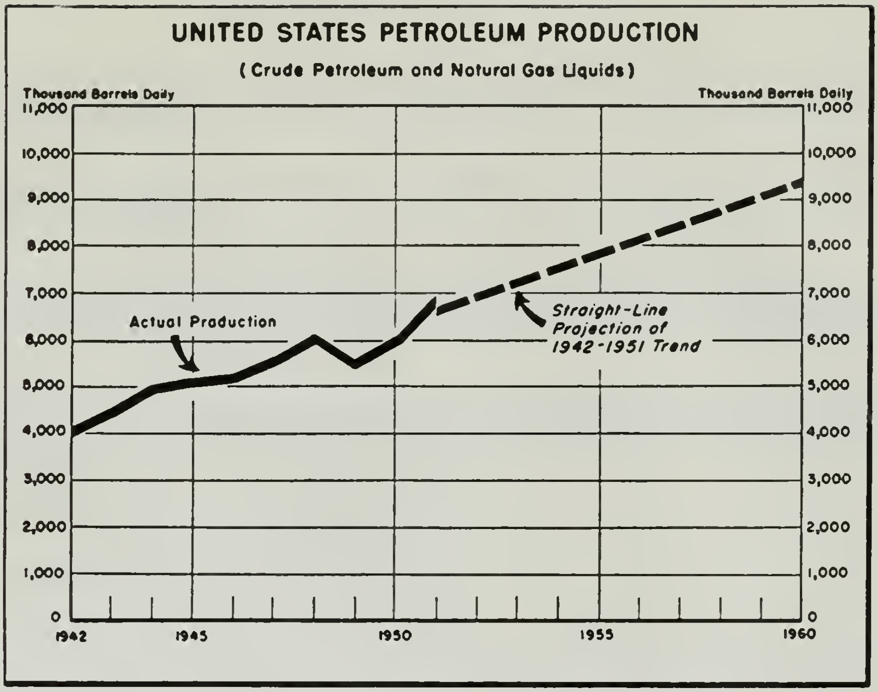
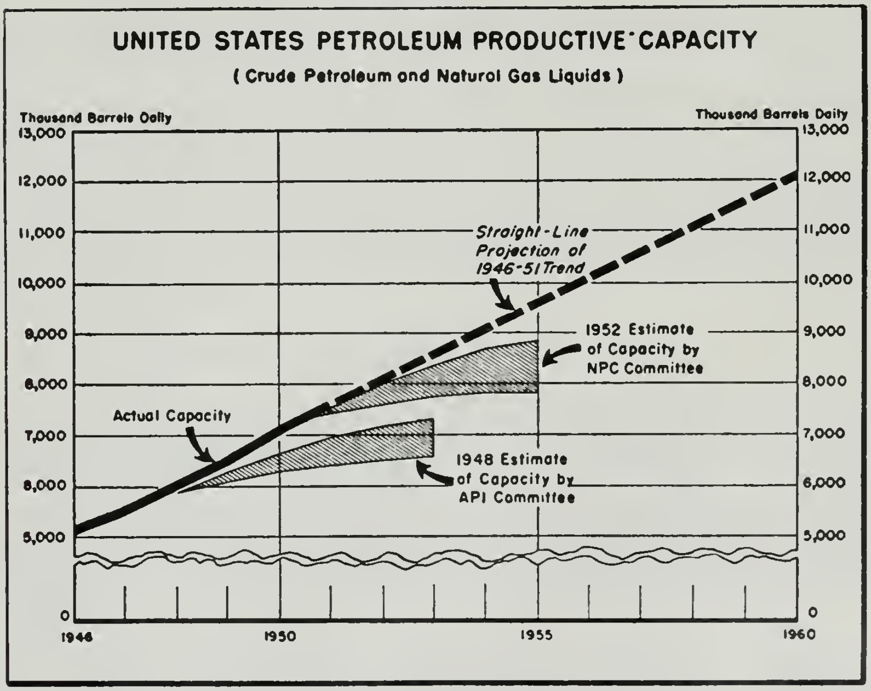


CHART 2[1]



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[1] "Petroleum in the Western Hemisphere," a report of the Western Hemisphere Oil Study Committee of the Independent Petroleum Association of America, pp. 53-54, (1952).

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